

EDITORIAL ARTICLES.

ON LAPAROTOMY IN CASES OF PERFORATION OF THE STOMACH AND INTESTINES.

Whilst the subject of laparotomy in cases of perforations of the intestinal tract is exciting so much discussion and widespread attention among the profession to-day, it will be interesting to note the observations of Prof. J. Mikulicz on this subject, in a paper read by him in the fifty-seventh meeting of naturalists in Magdeburg, and published in Volkman's collection of clinical lectures.¹

Whether a perforation be the result of direct or indirect trauma, of an idiopathic ulcerating process, or caused by the presence of a foreign body obstructing the bowel, the prognosis is generally a bad one, peritonitis soon ending the sufferings of the patient. In rare cases however, the opening in the bowel may be closed by a circumscribed adhesive peritonitis, before any of the bowel contents have escaped. But this has only been observed in cases of very small lesions or when the perforation is the outcome of a slow ulcerating process. To bring about this satisfactory state of things, however, has been, up to the present, the object of our therapeutic measures. Rational as this may appear, the meagre results attained thus far by this mode of treatment, may well cause the thoughtful physician to consider more energetic measures advisable, instead of remaining longer in the position of a quiet spectator, as it were; and to agree in principle with the surgeon who advises in such cases, laparotomy, suturing of the perforated bowel and by a thorough cleansing of the abdominal cavity to endeavor to allay threatening or beginning peritonitis.

Eminent surgeons, such as Nussbaum, Albert, Hueter, Gross, Berger, Zesas, consider this operation indicated in cases of traumatic perforation or rupture. Lloyd, Bouilly and others have performed laparo-

¹ No. 262. (Chirurgie No. 83.)

tomy in such cases, and Kocher and G. Tiling each, by a timely operation, succeeded in saving their patients. Mikulicz, furthermore, recommends laparotomy in cases of non-traumatic perforations, and Kuh and Rydygier advise it also in cases of perforating *ulcus rotundum* of the stomach.

So great has been the progress of surgery during the past ten years, that we no longer look upon opening the peritoneum with fear and doubt, as formerly, and to-day, when no abdominal organ is out of reach of the surgeon's knife, an apprehension of this kind should not restrain us from attempting to remove the primary cause of the trouble.

There are those, however, who oppose operative interference in these cases, such as Beck, who prefers the minimal chances of a spontaneous recovery, assisted by rest, opium, diet, etc. Leyden,¹ on the contrary, in his paper read before the Berlin Society for internal medicine in March, 1884, speaks strongly in favor of operating in cases of perforative peritonitis, and Landau,² Litten and Israel are of the same opinion.

Mikulicz reports 3 cases, operated by himself, during the past few years, a brief review of which will be found interesting.

CASE I. Male, Spanish Jew, æt. 25-30, of cadaverous appearance and in poor physical condition, was brought to clinic (Oct. 7, 1880) in an advanced state of collapse. Had been troubled with indigestion for seven years, and this had suddenly become worse a few hours prior to admission. On examination the abdomen found tense and distended, and painful to touch. Some tympanites. Face pale, extremities cool, pulse 120. Patient vomited frequently, the liquid smelling strongly of alcohol. On puncturing the abdomen, gas with strong odor of alcohol escaped, thus leaving no doubt as to the existence of a perforation in the stomach or intestines. Laparotomy performed that same evening. Incision in the middle line, from umbilicus to symphysis. On opening the peritoneum gas escaped and also a large quantity of dark-brown liquid, in which rice kernels were very plentiful, and which had besides a strong odor of wine. This liquid filled the whole

¹ *Deutsche med. Wochenschrift*, 1884. No. 17.

² *Deutsche med. Wochenschrift*, 1884. No. 16.

abdominal cavity. Intestines of normal appearance. Incision then enlarged up to the ensiform appendix. In the neighborhood of the cardia, on the lesser curvature of the stomach, an opening was discovered, 6 to 8 ctm. in length. The stomach was enormously distended and filled with the above described fluid. After the stomach had been emptied of its contents through the perforation opening, the latter was closed up by nine deep Lembert sutures. The peritoneal cavity was then washed out with a warmed 1% solution of thymol, the intestines, which had been enveloped during this procedure, in warm carbolized cloths, were replaced, and the abdominal wound closed. The operation lasted one hour, and left the patient in a very collapsed state. He did not rally, in spite of stimulants, etc., and died three hours later. The autopsy revealed, besides slight lesions of the lungs, the existence of a cicatrix in the immediate vicinity of the cardia. No connection between this and the perforation was, however, discovered. Over this latter passed a blood vessel with its branches, some 2 mm. in thickness. That the case was one of rupture of the stomach wall, is evident, no trace of any fresh perforating ulcer being found. The cicatrix in the vicinity may have had some connection with the rent, although nothing was found to warrant this belief, and there is also a possibility that there existed a small cicatricial spot at the place of rupture, which would have easily yielded to the great distension of the stomach. The patient's condition could furthermore have been caused by a blow on the stomach, or by a violent fall on the abdomen; also by the violent attempts of the patient to vomit.

Leube¹ mentions such cases, and H. Chiari described a similar one at a meeting of the Vienna Society of Physicians, Jan. 14, 1881.

The location of the rupture, so high up under the diaphragm, made suturing a very difficult task, but the rent was completely closed, as the autopsy showed.

There can hardly be a doubt but that death would have occurred in this case, in spite of an operation, so great was the state of collapse, before this. The end, however, may have been somewhat hastened thereby.

¹ Ziemssen's Handbuch der spec. Path. und Ther., Krankheiten des Magens.

The author lays considerable stress here on the avoidance in such cases of everything that might tend to induce conditions of collapse, especially the use of too energetic antiseptica.

CASE II. Male, æt. 49. No history of previous severe illness. Bowels always somewhat irregular, however, and for three days previous to admittance there had been no movement. Admitted Dec. 14, 1883, having been seized that same day with sudden great pain in the right inguinal region, which was followed two hours later by vomiting. After this no feces or flatus had been passed, and the vomiting became more frequent. There was some meteorism present and the abdomen slightly tense. In the cœcal region tenderness and resistance on pressure, also dulness on percussion. No fever. Pulse 108. Oleum ricini and calomel administered but without any effect. On Dec. 17, patient transferred to surgical clinic. Condition about the same. On examination under narcosis a rather large, elongated tumor, reaching from the right inguinal region upward in the direction of the liver, was felt. Excepting some well developed pulmonary emphysema, nothing else abnormal was found. Diagnosis vacillated between perityphlitis and obstruction of the bowel by invagination. Injections of water per rectum were now given and the Faradic battery used, in the hope that this might act favorably on the supposed invaginated intestine. The following day a small quantity of feces was passed, but otherwise the condition of the patient was unchanged. On the 19th the patient was much worse. Meteorism and pain increased, and the vomiting became more frequent. Operation decided on. Incision in the middle line. On opening the peritoneum about 1 litre of offensive smelling, purulent matter escaped. Intestines largely adherent to each other, intensely hyperæmic and covered with fibrin. The hand, passed into the region of the cœcum could detect nothing, that would cause the supposed intestinal occlusion, etc., so after some adhesions had been divided, the abdominal cavity was cleansed and the wound closed. Operation lasted one and one-half hours. In the night following patient vomited several times and passed a quantity of thin, offensive smelling feces. The following day he rallied somewhat. There was less meteorism but no cessation of the vomiting, and tenderness of abdomen remained the same. Several movements of bowels. Evening temperature 38.2°.

Pulse 120. No sleep. Dec. 21, patient's condition about the same. Dec. 22, great loss of strength and much dyspnœa. Increase of meteorism. Several stools. Edges of wound found swollen and red. Deep sutures removed. In spite of the frequent use of restoratives, etc., the patient continued to sink, and died on the evening of the 24th, five days after the operation. The autopsy showed, besides the existence of some bronchitis and pleuritic effusion, indications of intense inflammation of the cœcum and lower ileum. The vermiform appendix was twisted and adherent to the cœcum, and was furthermore perforated in several places, its mucous membrane being completely destroyed by ulceration.

In regard to this case the author admits that he considered the state of the patient a hopeless one, when, on opening the peritoneum the existence of purulent exudation was revealed, and that for this reason the cause of the existing symptoms was not sought for when the diagnosis of invagination, etc., had been found incorrect. The somewhat improved condition of the patient the following day, was surprising, and this Mikulicz attributes to the evacuation of the purulent exudation. He is furthermore inclined to believe that, if the perforated vermiform appendix had been excised and the opening in the cœcum closed, the inflammatory symptoms would, in all probability, have subsided and the patient have recovered.

CASE III. Male, æt. 40, always healthy until three days previous to admittance, when he had experienced a sudden, sharp pain in the abdomen, on springing from his bed. Pain increased and vomiting set in. Condition was the same the following day. No movement of the bowels. Symptoms increased in intensity in spite of warm applications, purgatives and injections. When admitted, on April 7, 1884, patient was in good physical condition, with no fever. Pulse 96. Tongue dry and strong fetor ex ore. Abdomen much distended and painful on pressure. On both sides there was dullness on percussion. Otherwise nothing abnormal found. Diagnosis of sero-purulent peritonitis caused probably by intestinal incarceration was made. Forced injection of water, made the following day, had no effect. Opium given internally and warm applications made. Some vomiting. Abdomen more tender and distended. Slight eleva-

tion of temperature, and pulse 100. Laparotomy that evening, seventy-two hours after commencement of illness. Incision in the middle line. On opening the peritoneum 1 litre of offensive smelling purulent matter escaped. The intestines intensely injected and covered in places with fibrinous exudation, and somewhat adherent to each other. On passing the hand into the peritoneal cavity a hard object was felt, about the size of a bean, which proved to be a piece of undigested potato. Several more pieces of potato were also found. It was evident that perforation of the bowel had taken place, and after a short search an opening, 6 mm. long and 4 mm. wide, was discovered in the small intestine on the left side, just above the crest of the ilium. Otherwise nothing abnormal discovered, excepting slight enlargement of the mesenteric glands. The intestine was cleansed, the edges of the rent trimmed off and the opening sutured. The abdomen closed after thorough toilette had been made. No drainage. The next day patient somewhat stronger, but the tenderness over abdomen remained the same. No movement of bowels. No vomiting. Ice and milk administered. Slight elevation of temperature in the evening. Patient vomited once the following day. On the third day after the operation, some fever and much pain in the wound. On removing the dressings the edges of wound were found swollen and red, the cutis having become necrotic in the neighborhood for quite a space. Deep sutures withdrawn, allowing the escape of considerable offensive smelling pus. Large drainage-tube now introduced. That evening less pain. On the fourth day patient passed large quantity of fecal matter per anum. He now made rapid advances toward recovery, his condition being in every way satisfactory. Although it was feared that the loss of substance about the wound would seriously interfere with this satisfactory state of things, it was found that a portion of small intestine had completely closed up the opening, having become adherent to the abdominal walls. Later on silver sutures were used to bring the separated edges nearer together. Patient was enabled to leave the hospital eleven weeks afterwards. Complete closure of the wound, however, took place some two weeks later. Mikulicz, who saw the patient several months afterwards, reports him as having been in good condition, going about his hard daily work with no discomfort whatever.

The author attributes the perforation, in this case, to an ulcerative process, probably a typhous ulcer. According to Strümpell and Weigert such typhous ulcers are usually found in that portion of the intestines where the perforation occurred in the case just described. The enlargement of the mesenteric glands would also help sustain this belief. The sudden development of symptoms of perforation would not necessarily interfere with the correctness of this diagnosis, as there have been enough cases observed, where perforation of the bowel gave rise to the first symptoms of a typhus ambulatorius. In concluding his remarks on this case, Mikulicz calls attention to the fact that although the edges of the rent were incised and sutured, thus reducing the lumen of the intestine considerably, no stenosis of the latter resulted from this.

These three cases cover the whole of the author's personal experience. The result of such operations will necessarily depend to a great extent on their being undertaken as early as possible and before peritonitis has set in. This opinion is also shared by Kocher,¹ Bouilly² and Lloyd³. Mikulicz thinks that the good results attained in Kocher's case, already alluded to, of gun-shot wound of the stomach, would justify the operation. Bouilly, who operated for rupture of the intestine from a kick, altered, by a too brisk interference (digital examination of an already developed fistula), the favorable progress of his patient toward recovery. Acute peritonitis was the result, ending fatally. In Tilling's⁴ case of stab wound of the abdomen with perforation of the stomach, complete toilette of the peritoneal cavity could be but partially effected, owing to the collapsed condition of the patient. No symptoms of peritonitis, however, developed, and recovery took place. We may include here those cases of stab-wounds of the abdomen, where the opening in the latter has been simply enlarged, the perforated organ drawn out and sutured. P. Schmidt⁵ reported a case of this kind, operated by Baudens. Peritonitis resulted in death. The autopsy

¹ Correspondenzblatt für Schweizer Aerzte. 1883. No. 2,324. Beiträge zur Chirurgie des Magens (Centralblatt für Chir. 1884. No. 15.)

² Jahresbericht von Virchow und Hirsch. 1883. II. Bd.

³ British Med. Journal, March 24, 1883.

⁴ St. Petersburg Med. Wochenschrift. 1884. No. 44.

⁵ Lehre von den Operationen am Bauche in Gunther's Operationslehre.

showed the existence of a third perforation, in the cæcum, besides the two which had been found during the operation. Wölfler¹ alludes to a case of perforation of the stomach, operated by a Bavarian physician in 1522. The experiment of Ch. T. Parkes² lead us to believe that more favorable results may be expected in operating for gun-shot wound of the intestines.

Cases of laparotomy in perforations resulting from ulcerous processes, are rare. Litten observed such a case, similar to the third one of the author. The operation was performed by Schroeder. There were symptoms of circumscribed peritonitis in the right iliac fossa, and a sub-cutaneous phlegmon with partial gangrene of the cutis. The intestine was found perforated and the opening closed. Recovery took place in five weeks, a fistula in the lower part of the abdominal wound, however, remaining. Billroth³ operated in a case of perforation of the sigmoid flexure, caused by a foreign-body (paint brush.) The patient, already greatly collapsed before the operation, died the same day. A case described by Chaput⁴ greatly resembles the author's second case. The abdomen was closed after circa 400 grammes of focal smelling pus had escaped. Death fifteen minutes later. The autopsy showed that the vermiform appendix was perforated by an intestinal calculus. F. Kaiser⁵ has collected in his very instructive work on this subject, all such cases when operative treatment was undertaken for peritonitis, without regard to the cause of the latter. A study of this work shows that laparotomy, in various forms of perforation of the stomach and intestines, may be followed by good results, even under most unfavorable conditions.

It might be well to consider here the difficulties arising in the performance of this operation. A chief difficulty lies in the impossibility in the larger number of cases of making a correct diagnosis of perforation, at a period when an operation would present good chances for re-

¹ Ueber die von Herrn, Prof. Billroth ausgeführten Resectionen des Carcinomatösen Pylorus. Wien. 1881.

² Gun-shot wounds of the small intestines. Chicago. 1884.

³ R. Wittelshöfer *W. Med. Wochenschrift.* 1884. No. 3, u. f.—Casuistische Beiträge aus Prof. Billroth's chir. klinik., Operat. am Darms.

⁴ Perforation de l'appendice ileo-cæcal par corps étranger.

⁵ *Archiv. für klin. Medicin.*, XV, Baud, S. 74, über die operative Behandlung der Bauchempyeme.

covery. The diagnosis is generally made when peritonitis has already set in and the time favorable to an operation has passed. The question is therefore, whether beginning or already developed peritonitis should contraindicate laparotomy. Although reopening and recleansing of the peritoneal cavity, undertaken to check acute peritonitis after surgical operation in the abdomen, has been so almost universally unsuccessful, yet the results attained in the cases of Bouilly, Israel, Lytten and Oberst¹, also in the author's third case, show that emptying the peritoneal cavity of the exudation, has been followed by recovery. Keith, Spencer Wells and others have demonstrated that ovariectomy has been successful, in spite of existing peritonitis.

The infectious form of peritonitis, resulting from perforation of the stomach or intestines, and which interests us mostly here, may be circumscribed or diffuse in its character, and on this latter would the prognosis of an operative interference largely depend. The chances of the inflammation subsiding are of course more favorable if the causative influence can be removed at the same time. Of great importance also in the prognosis of an operative treatment, is the more or less acute course of the peritonitis. In regard to this Mikulicz distinguishes three forms of perforative peritonitis: the *peracute*, causing death within 24 hours; the *acute*, lasting two to three days, and the *subacute*, which develops slowly, and ends fatally in five to fifteen days, sometimes later. Surgical help is only availing in cases of the peracute form, if obtained at once, and a diagnosis be sufficiently well established to justify an operation. Otherwise these cases may be regarded as hopeless. More time for observation may be allowed in the acute and subacute forms, but in all events, laparotomy is best performed as soon as possible. The character and cause of the peritonitis is influenced largely by the type of perforation present, rendering quick interference in the one case necessary, in another allowing longer time for observation. Of traumatic perforations the small ruptures and stab-wounds have certainly a better prognosis than gun-shot wounds, where a temporary closure of the perforation-opening through prolapse of the mucous membrane or adhesion to the opposing peritoneum is hardly to be expected.

¹ Centralblatt f. Chir. 1885. No. 20.

Regarding the stage of the peritonitis in which an operation would appear justifiable, the author points out the desirability of operating as soon as the first indications of peritonitis appear, but he does not think, however, that all hope of saving the patient should be abandoned even when the inflammation has assumed a high degree of development, such cases having recovered, as already mentioned. Neither should a moderate degree of collapse deter us from operating, although we ought to consider well, whether this be due to the final stage of the peritonitis, or simply to nervous depression resulting from the perforation.

The difficulty of making a diagnosis has already been alluded to. Although beginning peritonitis is generally the first indication of perforation, still even this at times fails to enlighten us as to the real condition of things, for instance, in cases of spontaneous perforation. Illustrative of this are two of the author's own cases, described above, and that of Chaput, in all of which intestinal obstruction had been diagnosed, the operation or autopsy first revealing the existence of a perforation in the intestine. And how often is this the case?

Although peritonitis may arise from so many other causes with such similar symptoms, thereby rendering our diagnosis doubtful, we should not even then be deterred from operating, says Mikulicz, for if, according to the opinion of Leyden and others, laparotomy, toilette of the abdomen and drainage is justifiable in cases of spontaneous peritonitis, so much the more would this procedure be indicated in cases where the causative influence of the peritonitis is directly accessible to surgical treatment.

The only partially sure indication of a perforation is, as is known, the presence of gases in the abdominal cavity, and if the presence of these can be proven a short time after the first symptoms appear, a diagnosis will not be difficult. The sharp pain, circumscribed or diffuse, with which perforations are usually accompanied, when they occur suddenly, is also of great diagnostic value, although in itself not always necessarily characteristic of these. In most cases of traumatic perforation the diagnosis can be made with the greatest probability or sureness, before pronounced symptoms of peritonitis will have developed. It is impossible, however, to lay down special rules and maxims in a general way or in regard to the different kinds of perforation. The

field of our experience is as yet too limited. It will be found advisable generally to operate quickly in most cases of gunshot wounds of the abdomen, even when the symptoms of intestinal perforation are not altogether evident. The experiments of Parkes, already alluded to, and the results attained by Kocher and Tiling, show this to be a proper procedure. On the other hand in cases of rupture and contusion it will be well to wait until the first symptoms of shock have subsided, a probable diagnosis being hardly possible before this. Mikulicz also advises that laparotomy be not too long delayed in cases of intraperitoneal injury of the bladder, wherein he agrees with Bartells, Kunz, Maltray, Julliard and Rivington, that the chances of recovery are but slight, if laparotomy and suturing of the bladder be not undertaken very soon, possibly within the first ten hours. Concerning the technique of the operation, the author recommends the incision in the middle line, as being, in the majority of cases, best adapted to a complete survey of the peritoneal cavity. In cases of perforation of the stomach near the fundus, however, the incision may be an oblique or transverse one. He alludes especially to the difficulty, often met with, of finding the perforation, and advises a thorough examination always of the intestine in its whole length. In cases of peritonitis, where no cause is known, the region of the cæcum should be closely scrutinized.

In cases of fresh ruptures and stab-wounds only should the excision of the perforation edges be neglected, before suturing. For the latter Mikulicz recommends silk. In small defects the excision of the edges may be in a longitudinal direction, but in larger wounds a transverse direction will be advisable. In order to avoid bending the intestine too much, it may be necessary to remove a longitudinal rhomboidal portion, the apex of which may reach to the mesenterium. Even a circular resection of a larger or smaller portion should be unhesitatingly undertaken if desirable.

Mikulicz calls attention, furthermore, to the proper and thorough toilette of the peritoneal cavity, and considers that the future of the operation depends greatly on the possibility of success in this direction. Care should be also taken to avoid the use of well-known strong disinfectants, as these are too apt to bring about a dangerous degree of collapse. Of no less importance is the proper drainage of the peritoneal

cavity in such cases where infectious peritonitis exists, especially when accompanied by copious exudation. The author points here to his second and third cases, as showing the error in neglecting this, and cites also a similar case of Bardeleben,¹ recently published. The drain should be at least as large as the small finger, and be carried well up in the vicinity of the perforation. When the peritonitis has assumed a more diffuse character, the introduction of several drains in different directions, would be advisable. Mikulicz recommends uniting the peritoneum by itself, dusting the edges with iodoform, before closing the abdomen.

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RECENT CONTRIBUTIONS TO THE LITERATURE OF CHOLECYSTOTOMY.

1. Cholecystotomy applied to the treatment of Biliary Calculi. By M. Jules Boeckel (Strasburg). *Revue de Chirurgie*. 1885. P. 801.
2. The Surgical Treatment of Gall Stones. By Lawson Tait, F.R.C.S. *Lancet*. 1885, Vol. II., pp. 239, 424.
3. Cholecystotomy; Notes on two successful cases. By A. W. Mayo Robson, (Leeds). *Lancet*. 1885, Vol. II, p. 806.

1. In this paper the author tries to show that where a biliary fistula exists, the operation for cholecystotomy is both simple and safe, but that where such is not present, the operation is difficult and dangerous. Three cases of operation for biliary fistula are narrated, two successful and one unsuccessful. In the latter, the fatal result is accounted for by the presence of a calculus in the common bile duct near the duodenum, which could not be recognized during life.

Where a biliary fistula exists, and shows no signs of healing spontaneously, B. holds that cholecystotomy, by opening up the fistula, is not only permissible but called for; that early intervention insures and hastens cure by preventing the ill effects of the constant escape of bile from the fistula; and that the operation, easy and safe in itself, is not appreciably less so when the peritoneum has to be opened, provided

¹ Berlin. Klin. Wochenschr. 1885. No. 25.